Abstract

Author: Bc. Denisa Hrdinová

Title: The motion pattern of abduction in the shoulder joint in overhead throwing of softball Extraliga players

Objectives: The aim of the thesis was to monitor and evaluate the difference in the sequence of tenses of muscle recruitment during the abduction in the shoulder joint between softball players and the general population, using surface electromyography (SEMG). A partial aim was to identify shortened muscle groups of the shoulder girdle and their influence on the timing of the abductors. Another partial aim was to evaluate the effect of shortened muscle groups on possible deficits in scapulohumeral rhythm of softball players.

Methods: The experimental group (n=10) and the control group (n=10) with a total average age of 21.8 ± 1.81 (SD) participated in the kinesiological analysis with targeted examination of the shortened muscle groups and scapulohumeral rhythm. Followed by SEMG examination of muscle timing during abduction in the shoulder joint. Five muscles were monitored during 15 repetitions of motion at 70 bpm. The SEMG signal analysis was processed by rectification and smoothing in MyoResearch software by Noraxon v3.80 and statistical analysis performed in program Statistica 13.4.

Results: 1. The difference in timing between the experimental and control group differed significantly in the onset musle Lower Trapezius 2. There was a statistically significant correlation between certain shortened muscles and timing of abductors in certain muscle groups. 3. There was a strong positive correlation found between shortened pectorales musles and scapulohumeral rhytm.

Conclusion: The study showed that in the case of timing, the individual movement
patterns differ from each individual's abduction. In the experimental group, the shoulder scapulas fixators are later activated compared to the control group. The result of timing, as well as the dyskinesia of the scapula of dominant upper limb in the scapulohumeral rhythm, are influenced by shortened muscle groups.

Keywords: Timing, Surface Electromyography, Scapulohumeral Rhytm, Overhead Throw..